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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/159,386      | 09/23/1998  | MASAHIRO MAKI        | 50023-097           | 5068             |

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EXAMINER

HA, DAC V

|          |              |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
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2634

DATE MAILED: 05/07/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/159,386

Applicant(s)

MAKI ET AL.

Examiner

Dac V. Ha

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-10,14,16-30 and 32-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-10,14,16-30 and 32-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

1. This is in response to the amendment filed on 04/25/02.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1, 2, 4, 6-10, 14, 16-30, 32-48** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashino et al. (US 5,682,376) in view of Hyll (US 6,005,893).

**Regarding claim 1**, Hayashino et al. disclose a Method Of Transmitting Orthogonal Frequency Division Multiplex Signal, And Transmitter And Receiver Employed Therefor which teaches all the claimed subject matter "a sending ... carrier signals" in Figure 1, element 1; Column 7, lines 45-61; Abstract. Hayashino et al. teach almost all the claimed subject matter in claim 1 as stated above, except for the claimed subject matter "a selection ... receiver side." However, the attention is now directed to Hyll. Hyll discloses a Reduced Complexity Bit Allocation To Subchannels In A Multi-Carrier, High Speed Data Transmission System which suggests the teaching of the claimed subject matter "wherein ... receiver side" as follow. Hyll utilizes a multi-carrier system for data transmission. More particularly, Hyll optimizes the use of the subchannel in accordance to the channel characteristic (i.e. based on SNR). The channel characteristic could have been determined at anywhere between the two transmission ends (Abstract; Figure 10; Column 3, lines 43-58.)

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the concept of controlling the transmitting and receiving of the multicarrier based on the channel characteristic taught by Hyll into Hayashino et al. to optimize the utilization of the multicarrier signals.

**Regarding claim 2**, Hayashino et al. further teach the claimed subject matter "a carrier ... transmission line" in Figure 1, element 1; Column 7, lines 45-66.

**Regarding claim 4**, Hayashino et al. further suggest the teaching of the claimed subject matter "there is ... generating means" in Figure 1, elements 15-19; Column 7, line 151 to Column 10, line 10.

**Regarding claim 6**, Hayashino et al. further teach the claimed subject matter "wherein ... carrier signals" in Column 1, lines 55-65, where the number of carriers is selectively generated depending on the desired requirement.

**Regarding claim 7**, Hyll further suggests the teaching of the claimed subject matter "wherein ... generating means" in Column 3, lines 42-58.

**Regarding claim 8**, Hyll further suggests the teaching of the claimed subject matter "wherein ... carrier signals" in Column 3, lines 42-58; Column 5, lines 13-38.

**Regarding claim 10**, Hyll further suggests the teaching of the claimed subject matter "an encoder ... said filter" in Figure 4, element 30, Column 2, line 34 to Column 3, line 58.

**Regarding claim 14**, see claim 3 above and further in Hayashino et al., Figure 2, element 2.

**Regarding claim 18**, see claim 14 above.

**Regarding claim 16**, see claim 6 above.

**Regarding claim 17**, see claim 7 above.

**Regarding claim 19**, Hyll further suggest the teaching of the claimed subject matter "wherein ... received" is known in the art in Column 1, lines 26-28.

**Regarding claim 20**, in Hyll's reference, a channel characteristic is determined based on a SNR. However, one skilled in the art would have realized that when a signal propagates through a channel and gets affected by the channel, many parameters of the signal would be affected. Hyll utilized SNR to determined the channel characteristic only as an option. One skilled in the art would have known that other signal parameter could have been utilized to enhance the determination of the channel, thus, better controlling of the signal detection. Therefore, the claimed subject matter "wherein ... reference phase" would have been obvious to one skilled in the art.

**Regarding claim 21**, see explanation in claim 20 above.

**Regarding claim 25**, see claim 10 above.

**Regarding claim 24**, the claimed subject matter "wherein ... value range" would have been obvious to one skilled in the art if other parameter, i.e. phase information, is utilized.

**Regarding claims 22, 23**, see claims 20 & 24 above.

**Regarding claim 26**, see claim 24 above.

**Regarding claim 27**, see claims 25 & 9 above.

**Regarding claim 28**, see claims 1 & 14 above.

**Regarding claim 29**, see claims 10 & 14 above.

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**Regarding claims 30, 32, see claim 15 above.**

**Regarding claim 33, see claim 4 above.**

**Regarding claim 34, see claim 9 above.**

**Regarding claims 35, 38, see claim 8 above.**

**Regarding claims 36, 37, see claims 6, 7 above, respectively.**

**Regarding claim 39, see claim 19 above.**

**Regarding claims 40, 41, see claims 20, 21 above, respectively.**

**Regarding claims 42, 43, see claim 21 above.**

**Regarding claims 44, 45, see claim 24 above.**

**Regarding claim 46, see claim 25 above.**

**Regarding claim 47, see claims 20 & 46 above.**

**Regarding claim 48, see claim 9 above.**

**Regarding claim 49, see claim 14 above.**

### ***Response to Arguments***

4. Applicant's arguments filed on 04/25/02 have been fully considered but they are not persuasive.

In the REMARK, on page 5, applicants argue that "According to Hayashino ... not an input signal as required by claim 1." Hayashino et al. teach an input bit streams (which is "an input signal") is multiplexed by element 12 (Figure 1) then modulated on a plurality of carriers (Figure 1, element 13.) Thus, in Hayashino et al.' reference, it is "an input signal" that is modulated on a plurality of carriers.

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In the REMARK, on page 6, applicants argue that "Sub-channel are assigned ... as required by claim 1." Hyll teaches the adjustment of number of bits for each channel, thus, the "intensity distribution" of each channel and therefore in turn, as would have been understood by one skilled in the art, the "intensity distribution" of the frequency spectrum used.

In the REMARK, on pages 4, 5, applicants argue "A prima facie ... limitation of the claims." Hayashino et al. teach a conventional method for utilizing multi-carrier for transmission of a signal. Hyll also teaches the transmission of signal utilizing multi-carrier in which improvement is made by optimizing the efficiency of each channel. Thus, one skilled in the art at the time of the invention would have motivated to combine the two aforementioned teaching to maximize the performance of the system.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chen et al. (US 6,215,777) disclose a Method And Apparatus For Transmission And Receiving Data Multiplexed Onto Multiple Code Channels, Frequencies And Base Statitons.

Tomisato et al. (US 5,504,783) disclose a Frequency Diversity Transmtter And Receiver.

Schuchman et al. (US 5,283,780) disclose a Digital Audio Broadcasting System.

6. This is a continued prosecution application (CPA) of applicant's earlier Application No. 09/159,386. All claims are drawn to the same invention claimed in the

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earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dac V. Ha whose telephone number is 703-306-5536. The examiner can normally be reached on 5/4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-6743 for regular communications and 703-308-6743 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 305-5500.




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Dac V. Ha  
Examiner  
Art Unit 2634

DH  
May 3, 2002



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